METHOD AND SYSTEM TO PROVIDE A HOME STYLE USER INTERFACE TO AN INTERACTIVE TELEVISION SYSTEM

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TECHNICAL FIELD

This disclosure relates generally to interactive television systems that provide interactive services, and more particularly but not exclusively, to a user interface for an

10   interactive television system.

BACKGROUND

An interactive television differs from a conventional television in that an interactive television includes

15   additional information and communication technology capabilities. These additional capabilities open up the possibilities for offering services or functionalities that are traditionally unavailable by use of conventional televisions. To some extent, interactive televisions perform

20   some functionality traditionally performed on a personal computer, such as web browsing, and e-mail service.

However, the trend of providing an interactive television that provides services traditionally found on a personal computer is accompanied with the challenge to provide an

25   interactive television user interface that is easy to learn and operate. This challenge involves designing a user

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interface that can be easily learned and operated by users who are not familiar with personal computers, since some or many interactive television users do not have personal computer experience.

5   Accordingly, there is a need for an interactive television user interface that is easily learned and operated by all types of users.

BRIEF DESCRIPTION OF THE DRAWINGS

10   Non-limiting and non-exhaustive embodiments of the present invention are described with reference to the following figures, wherein like reference numerals refer to like parts throughout the various views unless otherwise specified.

15   FIG. 1 is a block diagram illustrating an example of an interactive television (iTV) system that can implement an embodiment of the invention.

FIG. 2 is a block diagram illustrating the functionalities of the home-style user interface for the iTV

20   system of FIG. 1.

FIG. 3 is a block diagram illustrating an example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 4 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 5 is a block diagram illustrating another example of

5   an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 6 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

10   FIG. 7 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 8 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV

15   system of FIG. 1.

FIG. 9 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 10 is a block diagram illustrating another example

20   of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 11 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 12 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 13 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 14 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 15 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 16 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 17 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 18 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 19 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 20 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 21 is a flowchart illustrating the setup of options associated with a location, according to an embodiment of the home-style user interface for the iTV system of FIG. 1.

FIG. 22 is a flowchart illustrating the invocation of an option associated with a location, according to an embodiment of the home-style user interface for the iTV system of FIG. 1.

FIG. 23 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 24 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 25 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 26 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 27 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

FIG. 28 is a block diagram illustrating another example of an operation of the home-style user interface for the iTV system of FIG. 1.

5 DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

Embodiments of systems, methods, and devices for providing a home-style user interface for an interactive television system are described herein. As an overview, an embodiment of the invention provides a user interface that is

10 designed to be similar to everyday surroundings. The user interface is designed based upon associations of activities with specific locations.

The term "home-style" is used to describe the user interface because in one embodiment of the user interface,

15 different locations are associated with different activities (features) related to the location. For instance, different rooms in a building have different features associated with them. Or, different rooms in a dwelling, such as a house, have different features associated with them. In an

20 embodiment, the user interface employs pictures, icons, words, animation, video, and/or other types of graphical and/or textual representations to depict places (e.g., rooms, cubicles, offices, or outdoor areas) in an environment (or area) surrounding (or near) the user of an interactive

25 television system.

For example, the surrounding locations for a particular

user of the user interface might be rooms in a household such

as a kitchen. In that case, the word "Kitchen" might be

associated with features such as a recipe database;

5   information on television (TV) shows about cooking; a food

inventory and/or electronic grocery list; and/or information

associated with ordering food, restaurants, shopping, and/or

the like. Further, the recipe database might be connected to

other kitchen features, so that by accessing a recipe, the

10   food inventory might be accessed and the electronic grocery

list might be updated to reflect ingredients to purchase in

advance of preparing the recipe. Additionally, there might be

a cooking show on television or video that can be accessed

where the show or video teaches the recipe. By associating

15   features related to a particular location (in this example,

the kitchen), the home-style user interface has the advantage

of simplifying the electronic organization of information to a

novice computer user. That is, by associating features with

locations in real life where such features are available, the

20   home-style user interface has the advantage of being simple to

understand and operate, especially with regards to accessing

computerized features.

Further, since a place such as a kitchen in a house is

typically an environment that is shared by more than one

25   interactive television system user (or in this example, a

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household member), in one embodiment the home-style user interface suitably provides no access restrictions to the features associated with the kitchen or to the features associated with other non-restricted locations in a house. In this manner, if a particular location has restricted access, then the home-style user interface may provide restricted access to the function associated with the restricted particular location, and/or to the features associated with the function. In this example, since a household kitchen environment typically has no access restriction in real life, the home-style user interface may accordingly provide unrestricted access to multiple users to the Kitchen function and/or to the features associated with the kitchen function.

In an actual house area, the master bedroom or a home office room might have features that need to be secured, such as a locked cabinet. In one embodiment, the home-style interface provides the capability to, for example, restrict (or password-protect) access to designated functions themselves. That is, the restricted location (function) will not allow access to the associated features in the restricted-access location without appropriate verification input. In one embodiment, the home-style interface provides the capability to, for example, password-protected the individual features associated with restricted functions (locations in a house) such as a master bedroom. Such password-protected

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features might include parental control of a television, an automatic climate control system, or a home-security system, as well as any number of -features, such as email, a calendar, a telephone directory, and/or the like. By associating

5   normally secured features with a personalized location, such as a master bedroom, the home-style user interface can simplify the understanding of how the electronic information is organized and secured, and can provide a user interface that is easy to learn and use.

10   Accordingly, the invention advantageously provides a user interface for an interactive television system that overcomes the disadvantages of a more traditional personal computer user interface that is more likely to be used by one user at a time. The invention also advantageously permits its users to

15   associate (or group) features offered via an interactive television system in a manner that is simple to understand because the features are associated with functions that represent everyday surrounding locations.

Embodiments of the present invention advantageously

20   provide a user-friendly, home-style interface that is particularly well-suited to interactive television (iTV) services. Such iTV services are distinct and different from personal computer (PC) applications. The PC is generally a productivity platform. In contrast, iTV is more of an

25   entertainment and commerce platform. Hence, while PC

applications are typically "lean forward" in nature where the user directs the interaction to get work done, ITV services are typically more "lean back" in nature where the user is entertained or introduced to new products. The "lean back" nature of television fits well with the home-style orientation of the present invention.

In the description herein, numerous specific details are provided, such as examples of programming, user selections, transactions, and other features, to provide a thorough understanding of embodiments of the invention. One skilled in the relevant art will recognize, however, that the invention can be practiced without one or more of the specific details, or with other systems, methods, components, materials, and the like. In other instances, well-known structures, materials, or operations are not shown or described in detail to avoid obscuring aspects of the invention.

Reference throughout this specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, the appearance of the phrases "in one embodiment" or "in an embodiment" in various places throughout this specification are not necessarily all referring to the same embodiment. Furthermore, the particular

features, structures, or characteristics may be combined in any suitable manner in one or more embodiments.

FIG. 1 is a block diagram of an interactive television (interactive TV or iTV) system 100 that can implement an embodiment of the invention. However, other types of systems may also be used to implement an embodiment of the invention. The iTV system 100 typically includes a set top box 120, television (display device) 122, and a remote control device (or wireless keyboard) 125. Set top box 120 may be a consumer electronics device that serves as a gateway between the television 122 and a broadband communication network, such as a cable network 140. The connection to the broadband communication network may continue to a data communication network, such as the Internet, by way of, for example, a public switched network (PSTN). The set top box 120 receives the programming content or television signals from the broadband communication network, and delivers the television signals to the television 122. The set top box 120 also enables a viewer to select a television program to view and then delivers the television program to the television 122.

Alternatively or in addition, Set top box 120 may be a consumer electronics device that serves as a gateway between the television 122 and a satellite TV delivery system, such as a direct broadcast satellite (DBS) system. A DBS system may comprise a small 18-inch satellite dish (which is the antenna

fore receiving a satellite broadcast signal); a digital

integrated receiver/decoder (IRD), which separates each

channel, and decompresses and translates the digital signal so

a television can show it. Programming for a DBS system may be

5   distributed, for example, by multiple high-power satellites in

geosynchronous orbit, each with multiple transponders.

Compression (e.g., MPEG) is used to increase the amount of

programming that can be transmitted in the available

bandwidth.

10   A digital broadcast center may be used to gather

programming content, ensure its digital quality, and transmit

the signal up to the satellites. Programming may come to the

broadcast center from content and/or special digital tape.

Satellite-delivered programming is typically immediately

15   digitized, encrypted and uplinked to the orbiting satellites.

The satellites retransmit the signal back down to every earth-

station – or, in other words, every compatible DBS system

receiver dish at customer's homes and businesses.

Some programs may be recorded on digital videotape in the

20   broadcast center to be broadcast later. Before any recorded

programs are viewed by customers, technicians may use post-

production equipment to view and analyze each tape to ensure

audio and video quality. Tapes may then be loaded into a

robotic tape handling system, and playback may be triggered by

25   a computerized signal sent from a broadcast automation system.

Back-up videotape playback equipment may ensure uninterrupted transmission at all times.

Alternatively, or in addition, the television signals can be broadcast over a wireless medium and received by a traditional aerial antenna, and then delivered to the set top box 120.

As its name implies, a set top box is typically located on top of, or in close proximity to, a television. Alternatively or additionally, functionalities of a set top box may be integrated into a type of advanced television or other display device. For example, the functionalities of the set top box 120 can be built into circuitry of the television set 122 (e.g., an interactive television set). Another example is where there may be multiple set top boxes or where there is an "updated or expanded" set top box connected to the main set top box.

The set top box 120 includes a network interface 108 for interfacing with a broadband network such as the cable network 140. The set top box 120 may also include a converter 106 for converting digitally-encoded data streams (e.g., television signals) into a format directly readable by television 122. The set top box 120 receives the data streams from, for example, a broadband communication network, such as the cable network 140. As another example, the data stream is transmitted over a wireless medium and received by a

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traditional aerial antenna or by a satellite dish, and then

delivered to the set top box 120. The digital encoding for

the data streams may be, for example, in the Moving Pictures

Experts Group (MPEG) format. The incoming data stream is

5   processed by the set top box 120 and transmitted via coupler

128 for display on television 122. The coupler 128 may be,

for example, a data transmission wire or a wireless path.

In the embodiment shown in FIG. 1, set top box 120 is

further equipped with a receiver 110, such as an infrared (IR)

10   or radio frequency (RF) receiver 110. In other embodiments,

the receiver 110 may be configured to receive other

frequencies of the electromagnetic spectrum, such as Ultrahigh

Frequency (UHF), Very High Frequency (VHF), microwave, or the

like. Receiver 110 receives control signals 150 from the

15   remote control device 125 for operating the set top box 120

and the television 122, according to an embodiment of the

invention. In one embodiment, the set top box 120 is further

equipped with an optional transmitter 112, such as an IR or RF

transmitter, for transmitting control signals to the remote

20   control device 125.

In the embodiment shown in FIG. 1, set top box 120

further includes a controller (processor) 104 that is coupled

with a storage interface 102 and the converter 106. The

storage interface 102 provides an interface with a digital

25   storage device 114, such as a hard disk drive or other memory

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device. In this illustrated embodiment, digital storage device 114 stores the software (e.g., home-style engine or user interface engine 116) that implements the home-style user interface and related data, as described below. However, the

5   home-style engine (i.e., user interface engine) 116 may also be stored in another storage device that can be accessed by controller 104. Home-style engine 116 may be, for example, a program, module, instructions, or the like.

Controller 104 typically manages the operation of the set

10   top box 120, including, for example, the execution of the home-style engine (user interface engine) 116 to permit users to setup and access functions (e.g., function 415) associated with the different surrounding locations, and to setup and access features (e.g. feature 505) associated with the

15   different functions. In this embodiment, the locations are rooms in a household, as well as outdoor areas of a household such as a garden; however, the location may also be in other areas or environment. Controller 104 may be embodied as, for example, a micro-controller, microprocessor, digital signal

20   processor (DSP), Application Specific Integrated Circuit (ASIC), field programmable gate array (FPGA), or other suitable devices.

In response to commands from the remote control device 125, home-style engine 116 can provide unrestricted access to

25   functions associated with common-access locations (e.g., a

room such as the kitchen), while restricting access to functions associated with personalized locations (e.g., a restricted-access room such as the master bedroom) according to an embodiment of the invention.

In response to commands from the remote control device 125, home-style engine 116 can further provide unrestricted access to features associated with a common-access function, while restricting access to features associated with personalized functions according to an embodiment of the invention.

In the embodiment shown in FIG. 1, set top box 120 further includes one or more applications 115 associated with the enabling/triggering of various events. For example, the applications 115 may include a browser for accessing a Uniform Resource Locator (URL) address on the Internet and for permitting web pages in a URL address to be displayed on the television 122. Alternatively or in addition, the applications 115 may also include an e-mail application for permitting e-mail messages to be transmitted from and received by the set top box 120. Thus, the applications 115 may represent one or more application. The applications 115 may be stored in the digital storage device 114.

Remote control device 125 provides convenient remote control operation of the set top box 120 and/or the television 122. In one embodiment, remote control device 125 suitably

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includes a keyboard and/or control buttons 136. In the

embodiment shown in Figure 1, remote control device 125 may

include a receiver 132, such as an RF or IR receiver, for

receiving control signals transmitted by the optional

5   transmitter 112 of the set top box 120. Remote control device

125 further includes a transmitter 134, such as an RF or IR

transmitter, for transmitting control signals (commands) and

other data to the receiver 110 of the set top box 120. The

remote control device 125 can also transmit control signals to

10 the television 122 in order to enable certain operations, such

as the adjustment of the television volume and the like.

In one embodiment, the transmitters 112 and 134 modulate

control signals with a carrier frequency to enable

transmission of information between set top box 120 and remote

15 control device 125. For example, transmitters 112 and 134 may

operate according to Institute of Electrical and Electronics

Engineers (IEEE) 802.11a or 802.11b Wireless Networking

Standards. Alternatively, transmitters 114 and 134 may rely

on the Digital Enhanced Cordless Telecommunications (DECT)

20 technology, the "Bluetooth" protocol, or other suitable

standard or proprietary protocols. To achieve signal

modulation and transmission, transmitters 112 and 134 may

include various additional components not specifically

illustrated. For example, transmitters 112 and 134 may

25 include source encoders to reduce the amount of bandwidth

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required, channel encoders to modulate the transmitted information with a carrier wave, and transmission antennas to permit signal broadcast. An antenna for the transmitter 112 may be, for example, a substantially two-dimensional structure

5   formed as part of a printed circuit board within the set top box 120. Similarly, an antenna for the transmitter 134 may be, for example, a substantially two-dimensional structure formed as part of a printed circuit board within remote control device 125. Such integrated antennas are

10   advantageously compact and efficient to manufacture. Transmitters 112 and 134 may further include amplifiers to increase the transmission signal strength to an appropriate power level.

To permit control signal reception and de-modulation,

15   receivers 110 and 132 may include various additional components not specifically illustrated. For example, receivers 110 and 132 may include antennas for receiving the transmitted control signal, amplifiers for increasing the strength of the received control signal, and decoders for

20   separating and demodulating the received information from the carrier signal. The antenna of the receiver 110 may be formed as part of a printed circuit board within the set top box 120, while the antenna of the receiver 132 may be formed as part of a printed circuit board within the remote control device 125.

Reference is now made to the block diagram of FIG. 2 in order to describe the operation of the home-style user interface as performed by an embodiment of the invention. The remote control device 125 transmits one or more control signals 150 in response to user input. For control signals 150 received by set top box 120 and related to the operation of the iTV system 100, the controller 104 executes the home-style system engine (user interface engine) 116 and/or applications 115 to interpret and process the received information.

The following control signals may enable the following home-style system operations as shown in Table 1. It is noted that at least one command in Table 1 may be omitted and that other types of commands may be included in or substituted in Table 1.

Table 1

Command	Home-Style System Operation
Signal 151	Display Top-Level iTV Interface
Signal 152	Up Arrow
Signal 153	Down Arrow
Signal 154	Enter
Signals 155	Alphanumeric keys (i.e. Signal 155x represents the "x" key)

In one embodiment, home-style engine 116 suitably provides a settings table 200 (or a series of "setting" fields, also known as status indicators) that stores information associated with each one of the features

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associated with a particular function (location). In the embodiment illustrated in the following figures, the functions (locations) may be within (or in the vicinity of) a house. However, the particular function (and its associated location) is not limiting, and the particular function may correspond to another area such as, for example, a commercial office building or hotel. Each function has an associated setting or plurality of settings in an embodiment of the home-style user interface. For example, the house may have at least one of the following groups of settings, where each group of settings corresponds to a particular function: living room settings 210, audio-visual (AV) room settings 220, kitchen settings 230, garage settings 240, garden settings 250, gym settings 260, and/or one or more personal room settings (personal room 1 settings 270, personal room 2 settings, … through personal room X settings 290). Other types of settings may be included in or may be substituted in the plurality of settings in FIG. 2. Home-style engine 116 also provides a TV screen layout 130 for formatting information to be displayed on television 122.

Each -feature associated with a particular function (location) has an active/inactive setting (also referred to as a state or status indicator) for activating or deactivating the feature. Each feature may also have information about an associated triggerable event, such as an executable

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application 115 that can be selectively invoked via interactive TV system 100 when the state is active. The information about an executable event might be an address of (or pointer to) an executable application 115. When home-style engine 116 is directed by the user of iTV system 100 to access that particular active feature, the controller 104 uses the address or pointer information in order to trigger the associated event (i.e. execute an application 115 associated with the feature that the user wants to access).

The following settings equate to the following functions and features as shown in Table 2, which provides a convenient reference and further detail about which of the settings in settings table 200 (FIG. 2) belong to which features. It is noted that at least one of the functions and/or features shown in Table 2 may be omitted from settings table 200 and that other types of functions or features may be included in or substituted in settings table 200.

Table 2

Settings	Feature
Setting 211	Living Room Finance Feature
Setting 212	Living Room News & Events Feature
Setting 213	Living Room Family Calendar Feature
Setting 214	Living Room Web Feature
Setting 215	Living Room TV Feature
Setting 216	Living Room Phone Feature
Setting 217	Living Room Email Feature
Setting 218	Living Room Other Feature
Setting 221	AV Room Finance Feature

Settings	Feature
Setting 222	AV Room News & Events Feature
Setting 223	AV Room Family Calendar Feature
Setting 224	AV Room Web Feature
Setting 225	AV Room TV Feature
Setting 226	AV Room Phone Feature
Setting 227	AV Room Email Feature
Setting 228	AV Room Other Feature
Setting 231	Kitchen Recipes Feature
Setting 232	Kitchen Cooking Shows Feature
Setting 233	Kitchen Food Inventory Feature
Setting 234	Kitchen Order Food Feature
Setting 235	Kitchen Restaurants Feature
Setting 236	Kitchen Shopping Feature
Setting 237	Kitchen Appliances Feature
Setting 238	Kitchen Other Feature
Setting 241	Garage Tools Feature
Setting 242	Garage Automobile Feature
Setting 243	Garage Boat Feature
Setting 244	Garage Sale Feature
Setting 245	Garage Storage Inventory Feature
Setting 246	Garage Carpool Scheduling Feature
Setting 247	Garage Bus Schedule Feature
Setting 248	Garage Other Feature
Setting 251	Garden Sprinkler System Feature
Setting 252	Garden Planting Schedule Feature
Setting 253	Garden Botanical Information Feature
Setting 254	Garden Tools Feature
Setting 255	Garden Yard Maintenance Schedule Feature
Setting 256	Garden Bird Watching Information Feature
Setting 257	Garden Barbeque Feature
Setting 258	Garden Swimming Pool Feature
Setting 261	Gym Membership Feature
Setting 262	Gym Equipment Feature
Setting 263	Gym Workout Schedule Feature
Setting 264	Gym Baseball Practice Schedule Feature
Setting 265	Gym Other Feature
Setting 266	Gym Other Feature
Setting 267	Gym Other Feature
Setting 268	Gym Other Feature
Setting 271	Personal Room 1 School Feature
Setting 272	Personal Room 1 Sports Feature
Setting 273	Personal Room 1 Music Feature
Setting 274	Personal Room 1 Web Feature

Settings	Feature
Setting 275	Personal Room 1 TV Feature
Setting 276	Personal Room 1 Phone Feature
Setting 277	Personal Room 1 Email Feature
Setting 278	Personal Room 1 Other Feature
Setting 281	Personal Room 2 School Feature
Setting 282	Personal Room 2 Sports Feature
Setting 283	Personal Room 2 Music Feature
Setting 284	Personal Room 2 Web Feature
Setting 285	Personal Room 2 TV Feature
Setting 286	Personal Room 2 Phone Feature
Setting 287	Personal Room 2 Email Feature
Setting 288	Personal Room 2 Other Feature
Setting 291	Personal Room X School Feature
Setting 292	Personal Room X Sports Feature
Setting 293	Personal Room X Music Feature
Setting 294	Personal Room X Web Feature
Setting 295	Personal Room X TV Feature
Setting 296	Personal Room X Phone Feature
Setting 297	Personal Room X Email Feature
Setting 298	Personal Room X Other Feature

Some examples of the features listed in Table 2 are now described. For example, the "Finance" feature may typically be a portal to financial links on the World Wide Web, TV channels related to finance (e.g., CNNFN), and/or a financial software application that is typically loaded into the set top box 120. The financial software application has, for example, capabilities similar to that of the MS Money™ application or Quicken™ application adapted for the TV and set top box environment. Thus, selecting a feature enables the triggering of an event, such as an execution of at least one application, and/or presentation to the user of information related to the selected feature, and/or any other activity related to the selected feature. This definition of "event" should not be

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confused with the word "Events," as employed in the phrase "News and Events," which refers to a feature relating to "Current Events."

As another example, the "News & Events" feature may typically be a portal that highlights the latest news and/or links to news websites (e.g., cnn.com), TV channels (e.g., CNN, FOX News Channel, and/or local news in various channels).

As another example, the "Family Calendar" feature typically enables the execution of a similar application that currently resides in a set top box. However, this feature may instead trigger a web-based application for remote access. Typically, the "Family Calendar" would behave similarly to the calendar feature of, for example, MS Outlook™. Alternatively or in addition, the "Family Calendar" feature may optionally include "hot-synching" the "Family Calendar" with a personal digital assistant (PDA) or with another type of suitable device. The "Family Calendar" may be personalized and available for each member of the household, since individuals typically have their own schedule.

The "Web" feature may typically be a web portal such as, for example, www.Yahoo.com or www.MSN.com.

The "TV" feature typically permits the viewing of live television shows or recorded TV shows.

The "Phone" feature may be a Voice-Over-IP phone feature (e.g., DialPad™), or a video-conferencing feature (e.g., NetMeeting™ or CUSeeMe™).

The "Email" feature typically enables Email messaging and

5   could also include voice-mail and/or video-mail capabilities.

The "School" feature is typically an education-related portal. For example, the user may access an encyclopedia, dictionary, thesaurus, handbooks, and/or the like. If a school is wired and has the appropriate network capabilities,

10   the "School" feature may, for example, enable the downloading of coursework and/or homework and/or enable the video-conferencing to a class if the student-user is, for example, sick and is unable to physically attend class, or if the student-user is "tele-schooling".

15   The "Sports" feature is typically a sports portal with web site links and/or access to TV channels (e.g., ESPN, FOX Sports Channel, and ABC). This feature would, for example, reflect the user's preference for the certain types of sports and teams of choice. As another example, this feature might

20   include information, research and website links to sports and sports-related shopping (e.g. information on sports instruction such as golf lessons and tips).

The "Music" feature is typically a music portal. This feature enables, for example, access to web sites for music

25   listening, purchasing, and/or downloading. Alternatively or

25

in addition, this feature may also enable E-commerce

opportunities for electronic music purchases and ordering of

music compact disks and more. Alternatively or in addition,

there could be a music jukebox for managing the music

5   collection of the user, or for listening and downloading to a

portal music player such as, for example, an MP3 player such

as the Rio™ MP3 player from SONICblue Incorporated (Diamond

Multimedia Division). Alternatively or in addition, the

"Music" feature may enable a wireless transmission such as,

10 for example, the downloading of music to the car of the user.

FIG. 3 is a block diagram illustrating an example 300 of

an operation of the iTV system 100 of FIG. 1. Example 300

shows a top-level iTV interface menu 301, which is formatted

and displayed by home-style engine 116, upon receiving and

15 interpreting control signal 151 from remote control device

125. Home-style engine 116 formats the top-level iTV

interface in TV screen layout 130 (FIG. 2) and transmits

layout 130 to television 122 via coupler 128. In the example

of FIG. 3, the top-level iTV interface menu 301 displays an

20 "Our Home" option 310 along with the traditional iTV options,

which for instance, allow a user to watch TV (option 320),

watch video recordings (option 330), surf the web (option

340), check e-mail (option 350), or make changes to the iTV

environment (option 360). It is noted that Figure 3 shows an

25 example of a graphical representation of the options 310, 320,

330, 340, 350, and 360. Thus, the options 310, 320, 330, 340,

350, and 360 may be shown in the menu 301 in other forms such

as pictures, icons, text, animation, video and/or other

graphical and/or textual representations or combinations of

5   various types of representations. Furthermore, if the iTV

system 100 is implemented in another environment, such as a

hotel resort room, then the option 310 may have a different

title such as, for example, "Hotel Features".

Example 300 shows "our home" option 310 highlighted, as

10 denoted by the heavier line weight surrounding the option

name. In an embodiment, home-style engine 116 initializes the

display of a menu, such as the top-level iTV interface menu

301, by highlighting one of the displayed options. The

significance of an option being highlighted is that pressing

15 the enter button 390 on remote control device 125 invokes the

option that is highlighted. Thus, in this embodiment one

option is highlighted at a time.

In example 300, the highlighted option is "our home"

option 310. If that is the option that the user of iTV system

20 100 wants to invoke, then all the user typically needs to do

is to press the Enter button 390 on remote control device 125.

Remote control device 125 transmits control signal 154 to set

top box 120. Controller 104 (FIG. 2) passes the information

to home-style engine 116. Home-style engine 116 knows how to

25 respond to the Enter command, because home-style engine 116

previously formatted and displayed one of the options as highlighted in example 300. Home-style engine 116 responds by formatting the home-style menu in TV screen layout 130 and transmitting layout 130 to television 122 via coupler 128.

5   Referring now to FIG. 8, example 800 illustrates the home-style menu 801. Example 800 represents how the home-style menu appears before any of the room settings are active. Referring also now to FIG. 4, example 400 illustrates a second example of home-style menu 401 where at least one of the

10   settings each of nine rooms is active. How the home-style menu appears depends upon which functions (rooms) have active settings. That is, the functions (rooms) that appear on the home-style menu represent functions that have at least one active setting. Example 800 reflects the case where none of

15   the settings for any of the functions (rooms) are active. Example 400 represents the case where settings corresponding to nine functions (rooms) are active. It is noted that Figure 4 shows one example of a graphical representation of the functions 415, 425, 435, 445, 455, 465, 475, 485, and 495.

20   Referring also to FIG. 24, the functions 415, 425, 435, 445, 455, 465, 475, 485, 495 may also be shown in the menu 2401 in other forms, such as pictures, icons, text, animation, video and/or other graphical and/or textual representations or combinations of various types of representations.

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Home-style engine 116 determines which functions (rooms) to display on the home-style menu as follows. When prompted to display the home-style menu, home-style engine 116 checks the status indicators in settings table 200 (Living Room

5 settings 210, AV room settings 220, Kitchen settings 230, Garage settings 240, Garden settings 250, Gym settings 260, Personal Room 1 settings 270, Personal Room 2 settings, … and Personal Room X settings 290) to determine which, if any, of the features corresponding to each of those settings are

10 active. For any function (room) with one or more active features, home-style engine 116 considers the function active and displays the function (room) on the home-style menu. In example 800, since none of the features for any of the functions are yet active, home-style engine 116 displays none

15 of the functions (rooms).

Example 800 also shows an exit option 410. Exit option 410 appears on a number of the home-style screens and can be selected (e.g., highlighting the option 410 and pressing enter button 390). Upon the selection of the exit option 410, home-

20 style engine 116 typically formats the next highest-level menu on TV screen layout 130, and transmits TV screen layout 130 to television 122 via coupler 128. Television 122 interprets TV screen layout 130 and displays the next highest-level menu. For example, from the home-style menu, the next highest-level

25 menu is the top-level iTV interface menu 301 (FIG. 3). More

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generally the next highest-level menu is typically the menu that originally invoked the current menu.

In an embodiment, in order to make the home-style user interface as easy to use as possible, settings may be initialized prior to the first time that they are made available on a particular interactive TV system (a.k.a. software product initialization). For instance, the settings might be initialized so that certain settings corresponding to features that are predetermined to be the most popular features are active by default (e.g. referring again to FIG's. 4 and 24, settings corresponding to features corresponding to all nine functions (rooms) shown in menus 401 and 2401 might be active).

In another embodiment, the software product initialization may mean that settings are all initialized to an inactive state as shown in example 800. In this case, an option 430 that allows activation of "default" settings is provided to facilitate setup and use of the home-style user interface. Activate Default Settings (option 430) can be employed to activate a predetermined group of settings (for instance, those settings that correspond to features that are thought by marketers and product designers to be the most popular features).

Initialization to active of one or more predetermined settings makes the user interface easier to use.

Additionally, initialization of on or more predetermined settings accommodates users who may not want to be bothered with customization of the home-style interface. Additionally, or alternatively, a default settings option also serves these purposes.

To describe the full customization capabilities of the home-style user interface, a series of examples is now presented in an embodiment where none of the settings are initialized to active. Still referring to example 800, to change the active/inactive state of any of the features, the user of remote control device 125 typically selects the Customize Settings option 420. Since example 800 shows the Customize Settings option 420 highlighted, the user of remote control device 125 typically needs only to press the Enter button 390 to invoke the option 420. Remote control device 125 processes the information entered and transmits control signal 154. Set top box 120 receives control signal 154 and relays the control signal to home-style engine 116. Home-style engine 116 interprets control signal 154 and formats the Customize Settings menu 901 (FIG. 9) on TV screen layout 130 for display on television 122 (FIG. 9).

Referring now to FIG. 9, example 900 illustrates the home-style settings menu 901 that allows a user of the interactive TV system to customize settings for the different functions (rooms). In an embodiment, the home-style settings

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menu 901 includes, for example, the capability for customizing

settings corresponding to features for a living room function

(option 915), an audiovisual room function (option 925), a gym

function (option 935), one or more personal room functions

5   (option 945), a kitchen function (option 965), a garage

function (option 975), and/or a garden function (option 985).

To change the active/inactive state indicator for features

corresponding to any of the functions (rooms), the user of

remote control device 125 first selects the appropriate option

10   corresponding to the function. For example, to change the

active/inactive state for any of the living room features, the

user of remote control device 125 first selects Living Room

Settings option 915. Upon receiving an appropriate control

signal and interpreting the request, home-style engine 116

15   formats a list of active and inactive living room features

from the information in Living Room Settings 210 (FIG. 2, see

also settings 211 - 218 in Table 2)) on TV screen layout 130,

transmits TV screen layout 130 to television 122 via coupler

128 for television 122 to display the Customize Living Room

20   Settings menu 1001 (FIG. 10).

Referring to FIG. 10, example 1000 illustrates the

Customize Living Room Settings menu 1001 that shows the state

of all available preset features as inactive. Each preset

feature (non-customizable feature) has an associated

25   active/inactive setting. For instance, the finance feature

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(505) has an associated active/inactive state (option 1005), which is currently inactive. In an embodiment, on this type of settings menu 1001 the user can highlight any of the active/inactive states (e.g. options 1005-1050), the other

5   feature option 1060, and the exit option 410, by scrolling (i.e., pressing the up arrow 370 or the down arrow 380). However, the living room features themselves (505 through 560) typically cannot be highlighted or selected on this type of settings menu.

10   In an embodiment, home-style engine 116 provides "preset" features associated with a living room, including, for example, the following features: Finance (505), News and Events (510), Family Calendar (515), Web (520), TV (530), Phone (540), and Email (550). The state corresponding to each

15   of the preset features toggles from active to inactive when the corresponding active/inactive option is selected. For instance, selecting the option 1005 associated with the preset finance feature 505 toggles both the setting 211 and the displayed state of the setting (option 1005) to Active. That

20   is, if the setting is inactive in settings table 200 (FIG. 2), then selecting the corresponding inactive option changes the setting to active in settings table 200, as well as changing the displayed status indicator option to active. The converse of these parallel operations is also true. For instance, if

25   the setting is active in settings table 200, then selecting

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the corresponding status indicator of active changes the state to inactive in settings table 200, as well as changing the displayed status indicator to inactive.

In an embodiment, "preset" features are those that have a triggerable event (i.e. an executable application 115 stored on set top box 120) already associated with them, and which appear by default on a particular function settings menu so that each of them can be activated very quickly by selecting the corresponding option on the settings menu. To activate any of the preset features, the user of remote control device 125 selects the corresponding option (e.g., by highlighting an inactive option displayed for the associated preset feature and pressing the enter button 390). Home-style engine 116 then flags as active the setting in settings table 200 that is associated with the present feature (FIG. 2, Table 2). Home-style engine 116 then redisplays option corresponding to the preset feature as active.

For example, finance feature 505 has an associated active/inactive living room finance feature setting 211 (Table 2) in settings table 200, as well as an associated option 1005 that is employed by the user of the home-style user interface to activate/deactivate setting 211. In this example, option 1005 is displayed as "inactive," to reflect the state of setting 211 in settings table 200.

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To change the state of setting 211 to active, the user of remote control device 125 employs the up arrow key 370 or down arrow key 380 to highlight option 1005 and presses the enter button 390. Remote control device 125 processes the

5   information entered and transmits control signal 154 to the set top box 120. Set top box 120 receives control signal 154 and relays the control signal to home-style engine 116. Home-style engine 116 interprets control signal 154 and determines that the user intends to toggle option 1005, because home-

10   style engine 116 keeps track of the particular field (shown on the display) previously formatted as highlighted. Home-style engine 116 also determines that option 1005 is currently displayed as inactive, and reformats the display of option 1005 to be "active." Home-style engine also changes from

15   inactive to active the setting 211 (in settings table 200) that corresponds to the option 1005. Home-style engine then displays the updated Customize Living Room Settings menu on television 122 with option 1005 displayed as active (see FIG. 11).

20   Each preset feature also has an associated icon, which serves to facilitate a user's learning of the home-style user interface product. The icons serve to visually associate an application in a manner similar to the function that icons serve in a personal computer user interface. That is, once a

25   user begins to associate certain icons with certain features,

the user no longer needs to read all the text. Instead, the user will more quickly recognize the feature by its icon.

For instance, the Finance feature 505 has an associated icon depicted herein by a dolloar sign; the News and Events feature has an associated icon depicted herein by a circle around the letter "i;" the Calendar feature has an associated icon depicted herein by the numbers "2001" (denoting calendar year); the Web feature has an associated icon depicted herein by a graphic of a personal computer; the TV feature has an associated icon depicted herein by a graphic of a television; the Phone feature has an associated icon depicted herein by a graphic of a telephone handset; and the E-mail feature has an associated icon depicted herein by a graphic of an envelope.

Icons may be more pictorial than are represented in these figures, and may suitably be provided by the event (i.e. application 115) associated with the feature. For instance, if the finance feature 505 were associated with the MS Excel™ application 115, then the icon would suitably be the standard MS Excel™ icon (an X in a box in front of a piece of paper).

In an embodiment, home-style engine 116 tracks information that reflects the active or inactive state of settings, as well as information about how to trigger a particular event for each feature. Information about each triggerable event might include information about how to invoke a particular application 115, and/or the type (or

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category) of application 115. For instance, each application 115 typically has a defined set of application programming interfaces (API's), and one of the jobs of the API's is to identify the application to the system as to what category or type of application it is (i.e. game, financial application, communication, media player, etc). Home-style engine 116 calls the API's and queries the application, which responds with a predetermined answer. By querying for type, home-style engine 116 knows how to invoke a particular application for each option. Home-style engine 116 suitably stores other types of information for other types of executable events.

When the user of home-style engine 116 effects a change of a setting from inactive to active, or vice versa, home-style engine 116 reflects the changed status. In this example, living room finance feature 505 is associated with home-style engine setting 211 in settings table 200 (see also Table 2). Setting 211 is updated to reflect the active state of the living room finance feature 505. Because finance feature 505 is a preset feature, home-style engine 116 associates a particular predetermined executable event (such as a particular application 115) with finance feature 505. Referring to FIG. 11, example 1100 illustrates the Customize Living Room Settings menu 1101 that shows the finance feature 505 as active, but the rest of the preset features 510 to 550 as inactive. In contrast, as stated above, the example of the

Customize Living Room Settings menu 1001 in FIG. 10 shows the

finance feature 505 as inactive.

In addition to the preset features 505 through 550, home-

style engine 116 may provide a customizable "other" feature

5   560, which has an add option 1060 for assigning a feature to a

particular function (room). Each function (room) settings

menu typically has an "other" feature with a corresponding

option that enables the addition of features other than the

preset features preset for a particular function. Thus,

10   Customize Living Room Settings menu 1101 has an "other"

feature 560 with an associated add option 1060 for adding a

feature to the living room function. The user of remote

control device 125 may select the option 1060 associated with

the "other" feature 560 to select a feature to add to the

15   living room.

The "other" feature 560 allows the user of remote control

device 125 to add a particular customized (i.e. not preset)

feature for a particular function (room). In one embodiment,

home-style engine 116 has a list of features that can be

20   customized (i.e. added) to a function. In that case, home-

style engine 116 may have a particular executable event (such

as a particular application 115) associated with customizable

features, because those features are already identified to

home-style engine 116 and need only be associated with one or

more particular functions by the user of the home-style user interface on the iTV system.

In another embodiment there may be additional customization capabilities, which include adding features that are not already identified to home-style engine 116. In this case, the user of the home-style interface must provide home-style engine 116 with sufficient information to allow an event to be triggered in association with the invocation of a customized feature.

In both cases, because there is no one particular triggerable event associated with the "other" feature, there is no icon that is displayed in association with the "other" feature. Once a customized feature has been sufficiently identified (as explained in the discussion that follows), an icon can be suitably provided in association with the customized feature.

Activation of a customizable feature requires additional information from the user of remote control device 125. In one embodiment, the "other" feature 560 permits the adding of a particular executable event (i.e. a particular application 115) that is already identified to home-style engine 116 and stored in the set top box 120 or in a memory device that is accessible by controller 104.

Referring now to FIG. 23, an example 2300 illustrates a list of triggerable events (applications 115) in an embodiment

that are available to be added through the "other" feature in an embodiment of the home-style user interface. Each customizable feature listed on menu 2301 has an associated triggerable event already defined to home-style engine 116, which may be suitably stored in the set top box 120. On menu 2301, four customizable features are available as "other" features: Art Collection I 2305, Super Finance Calculator 2310, Wing Zero TM 2315, and Chef Glen's Cookbook 2320.

Each of these features has an associated icon, and a description of the feature that is displayed to correspond to a particular feature that is highlighted. The description provides the user of the home-style user interface with further information about the customizable feature. For instance, the description for the customizable Art Collection I feature 2305 provides information about the title of the feature or executable event (or the source of the associated executable event), a description of the feature (tutorial on classical art), versioning information (time and date), and the category or type of feature (or type of executable application associated therewith). Examples of types include game, financial application, communication, media player, etc. The type or category of feature (or associated executable event) assists the user to quickly identify the expectation for the use of the application. Many times the title doesn't provide sufficient information for a user to determine what a

feature might be, or is about. That is, the type or category

of the feature helps the user with the identification and

organization of a feature with respect to the different

functions. This is especially useful if the list of available

5   features is shared by when invoking the "other" feature from

the settings menus for all functions.

Each customized feature also provides a suggested

function that can suitably be employed by the user of the

home-style user interface, as an indicator of to what function

10   this customizable feature is suitably associated. For

instance, the suggested function for the Chef Glen's Cookbook

feature 2320 is the Kitchen function. The three other

customizable features listed suggest a "general" function,

meaning that these customizable features are suitably

15   associated with multiple or many functions. The suggested

function of Kitchen on the Chef Glen's Cookbook customized

feature 2320 does not restrict the user of the home-style user

interface from adding this feature to the living room.

Instead, the suggested feature is merely suggestive of an

20   appropriate function association.

To add one of the listed features for the particular

function (room), the user of interactive TV system selects the

application (i.e. highlight the option using the up arrow

button 370 and/or down arrow button 380 and then pressing the

25   enter button 390), and Upon selecting option 2320, referring

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now to FIG. 13, the user is returned to the living room

settings menu 1301 where the Art Collection feature 1310 and

the corresponding activation/deactivation option 1060 are now

displayed on the Customize Living Room Settings menu 1301.

5   Correspondingly, home-style engine 216 sets setting 218

(living room other feature) in settings table 200 (see also

Table 2) to active. This manner of customizing an "other"

feature for a room is very easy for a user of the interactive

TV system having little experience with personal computers and

10 computer applications; because, all that a user has to do to

add a customized feature to a function is select from a list

of available features. This manner of customizing further

provides additional information about each of the available

customizable features, such as a suggested associated

15 function, a description, and versioning information

Referring now to FIG. 12, example 1200 illustrates an

alternative method of permitting a user of home-style engine

116 to customize an "other" feature, such as the living room

"other" feature 560, according to an embodiment of the

20 invention. On menu 1201, the user of home-style system 116 is

prompted to employ alphanumeric keyboard keys 1230 to enter a

feature name in input field 1210 and a executable event, such

as an application in input field 1220. By allowing the user

to input a feature name (i.e. designate/choose a feature

25 name), the home-style user interface provides additional

customization capability. Further by allowing a user to input a command line for an executable event, the home-style user interface provides additional customization capability, in that the user is now able to invoke events that are outside

5   what was delivered in the home-style user interface software product.

Alternatively, input field 1210 might operate as a drop down list of feature names and corresponding triggerable events. This alternative would share benefits with the method

10   described above and illustrated in FIG. 23, in that with drop down lists, the user is not required to know the syntax for invoking a customized procedure. Additionally, the available features are already named.

The feature name 1210 is the feature name that appears on

15   the function (room) menu (e.g., menu 1101 in FIG. 11), and the triggerable event (i.e. an application) is the file name (including path) or executable command line that will be invoked when the user of remote control device 125 subsequently selects the activated customized feature.

20   Suppose for instance that the user of iTV system 100 owns an art collection that is displayed on the walls of the living room. Suppose that the user also owns a computerized tutorial program on classical art that he or she would like to invoke via iTV system 100. For this scenario, the user of iTV system

25   100 might want to add a customizable "other" feature (via

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option 1060) to the living room with the iTV system 100. To

do so, the user of iTV system 100 selects the "other" add

option 1060 and is presented with menu 1201 of example 1200

of FIG. 12. By employing the alphanumeric keyboard keys 1230,

5   the user can type in the name of the feature (in field 1210)

to be Art Collection. Alternatively, if the home-style

interface already has this feature available as a customized

feature (that is, has information about an associated

triggerable event), the user might be able to select the name

10   from a drop down list of names. Remote control device 125

transmits this information to set top box 120 via control

signals 155. Control signals 155 collectively include a

control signal for each of the keyboard keys 1230. For

instance, signal 155a represents the "a" key; signal 155A

15   represents the "A" key.

The feature name "Art Collection" is employed by home-

style engine 116 to be associated with living room other

setting 218 in settings table 200 (see also Table 2), and will

be displayed as an active feature whenever the living room

20   menu is displayed in an embodiment of the home-style user

interface. In addition to the feature name, the user can

employ the alphanumeric keyboard keys 1230 (or alternatively,

a drop down list of triggerable events) to enter the name of

the particular triggerable event (i.e. an executable

25   application 115) to be associated with "Art Collection" and to

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be invoked by controller 104 when the user selects the "Art Collection" feature. In this example, the particular triggerable event is an executable tutorial application 115, which is invoked via the command "D\:artclassics.exe" which is

5   what is entered into input field 1220. Remote control device 125 transmits this information to set top box 120 via control signals 155. The information about the associated triggerable event is also associated with living room other setting 218. When both the feature name (in field 1210) and the triggerable

10   event command information (in field 1220) have been entered or identified, the customization of the other option 560 is complete, and (referring to FIG. 13) the user is returned to the living room settings menu 1301 where the Art Collection feature 1310 appears with an option 1060 that reflects that

15   the feature is now active.

Although in one embodiment, the settings table provides storage for only one customizable feature per function, there could easily be many. For instance, settings information for a plentitude of customizable features may suitably be stored

20   in a separate table. The information in the separate table may include the function name, which would provide the benefit of having all customizable features in a common storage area and flexibly assignable to whatever function that a user wants to customize. In this type of design, the other feature would

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suitably continue to appear on the settings menu, even after

one customizable feature has been added to a function.

Referring the discussion back to preset features, the

user of iTV system 100 may activate as many of the preset

5 features as desired. Example 1300 shows two living room

features as active (finance feature 505 and art collection

feature 1310). When the user of iTV system 100 has activated

all the desired living room features, the X option 410 may be

employed to return to the higher-level menu (in this

10 particular example, Customize Settings menu 901 in FIG. 9).

When the user of remote control device 125 selects the X

option 410, set top 120 displays the next higher-level menu

901 (FIG. 9). When the user of iTV system 100 has finished

making settings changes, the user of remote control device 125

15 can select the X option 410, and set top box 120. Set top 120

then displays the next higher-level menu 1401 (FIG. 14).

Referring to FIG. 14, whenever the user of iTV system 100

activates one or more features in a function (as, for example,

described above for the living room), the function (room)

20 itself becomes active. That is, once a feature of a

particular function (room) is active, the function (room) is

active on the home-style menu. Example 1400 illustrates the

home-style menu 1401 after one or more features have been

activated in the living room. In this example, no other

25 function (room) is displayed on the home-style menu 1401,

because until now only living room function 415 has (a feature that has) been activated.

If the user of remote control device 125 selects the living room function 415 on example 1400 and presses the enter button 390, the remote control device 125 transmits control signal 154. Home-style engine 116 then queries the living room settings 210 (FIG. 2) to format and display the Living Room menu 1501 (FIG. 15). Example 1500 shows each of the active features (e.g., features 505 and 1310). Living Room Settings 915 can also be accessed from the Living Room menu 1501. Selecting Living Room Settings 915 invokes the Customize Living Room Settings menu (as shown in FIG.'s 10, 11, and 13).

The Living Room menu 1501 also typically includes a video/image area 570, which operates similarly to a standard picture-in-picture image, to provide a video stream in addition to the display of the active room features. That is, the user of iTV system 100 can be, for example, watching TV or a video on the small TV/image area 570 within the larger living room menu 1501. Alternatively, an image may be displayed on area 570. In this manner, a video stream may be watched during the navigation and operation of the home-style user interface.

The Living Room menu 1501 also typically contains a text box 580 containing other types of displayable information,

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which is displayed in addition to the active living room

features. For instance, text box 580 might contain an

advertisement, messages, and/or other information. In this

manner, text may remain stationary during the navigation

5 between menus of the home-style user interface that contain a

text box such as text box 580. Text box 580 also provides a

suitable means to display "help" text for users of the home-

style user interface, or to provide information associated

with a highlighted feature (similar to the description text

10 box 2350 on FIG. 23).

If the user of iTV system 100 selects finance feature 505

or any other present and active features, home-style engine

116 invokes the particular triggerable event (i.e. application

115) that is associated with the selected feature. If the

15 user of iTV system 100 selects a customize feature, such as

art collection feature 1310, home-style engine 116 invokes the

particular application 115, that was either already associated

with the Art Collection feature (if that information was

available as in FIG. 23), or as entered by the user of the

20 home-style user interface in text input field 1220 on FIG. 12.

The previous series of examples has described how iTV system

100 allows a user to set up a home-style user interface that

typically reflects features associated with particular

environmental surroundings.

Referring now again to FIG. 4, in example 400 there are active features in each of the nine functions (rooms) 415, 425, 435, 445, 455, 465, 475, 485 and 495 in the home menu 401. Selecting living room function 415 causes home-style engine 116 to query living room settings 210 (FIG. 2) in order to format and display the living room menu 1501 (FIG. 15). It is noted that Figure 4 shows one example of a graphical representation of the functions 415, 425, 435, 445, 455, 465, 475, 485 and 495. The functions 415, 425, 435, 445, 455, 465, 475, 485 and 495 may also be shown in other forms such as pictures, icons, text, animation, video and/or in other graphical and/or textual representations or combinations of various types of representations. For instance, referring now to FIG. 24, example 2400 illustrates the Our Home 2401 represented in rough form as a residential floor plan. Each of the active functions 415, 425, 435, 445, 455, 465, 475, 485 and 495 are depicted as boxes, which can be highlighted and selected by pressing the enter button 390 to invoke the associated function menus. For instance, selecting the Living Room function 415 on menu 2401 prompts home-style engine 116 to format and display the living room menu 1501 (FIG. 15).

Referring now to FIG. 5, another example is shown of a living room menu 501 with seven (7) active features (i.e., features 505 to 550 and feature 915). The features enable various types of operations (executable events) as described

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in the above-mentioned examples. It is noted that Figure 5

shows an example of a graphical representation of the features

505 to 550 and 915. Thus, the features 505 to 550 and 915 may

be shown in the menu 501 in other forms such as pictures,

5   icons, text, animation, video and/or other graphical and/or

textual representations or combinations of various types of

representations. For instance, referring now to FIG. 25,

example 2500 illustrates an alternate manner of depicting the

active living room features (505 - 550). Each of the icons

10 can be highlighted and selected by pressing the enter button

390. Selecting any of the displayed features prompts home-

style engine 116 to invoke the executable event associated

with the feature.

Alternatively and referring back to FIG.'s 4 and 24, the

15 user of iTV system 100 might alternatively select kitchen

function 465 in home menu 401 or on menu 2401. Home-style

engine 116 then queries kitchen settings 230 (FIG. 2) in order

to format and display the kitchen menu 701 (FIG. 7). Example

700 shows six active features (705 to 755) and the kitchen

20 settings option 965. If the kitchen function 465 on menu 401

is selected, then the user could, for example, be presented

with menu selections related to various recipes (feature 705),

television shows about cooking (feature 715), an electronic

grocery list (feature 725), and/or the like. If, for example,

25 the user selects a recipe (via feature 705), then an

appropriate events (i.e. applications 115) are triggered so that the user may print the recipe, email the recipe, view an episode of a cooking show that teaches the selected recipe, and/or select at least another feature that relates to the

5   selected recipe.

It is noted that Figure 7 shows one example of a graphical representation of the features 705 - 755. The features 705 - 755 may be shown on the Kitchen menu in other forms such as pictures, icons, text, animation, video and/or

10   other graphical and/or textual representations or combinations of various types of representations. For instance, referring now to FIG. 27, example 2700 illustrates an alternate manner of depicting the active kitchen features (705 - 755). Each of the icons can be highlighted and selected by pressing the

15   enter button 390. Selecting any of the displayed features prompts home-style engine 116 to invoke the executable event associated with the feature.

In an embodiment, both the living room and the kitchen are examples of common functions (or functions without any

20   security settings). In an environment where there are multiple users of iTV system 100, it may be desirable to have security on certain functions (rooms) and/or certain features. In the illustrated embodiment, security is available in the setup of personalized functions/locations (or personalized

25   rooms). Referring again to FIG. 9, a personalized and

optionally secured function (room) can be created via personal

room settings 945.   If there are no personalized functions

(rooms) yet identified, home-style engine 116 typically

formats and displays a request for identification of a new

5   specific personalized function (room) as shown in menu 1601

(FIG. 16).

Referring now to FIG. 16, example 1600 illustrates

identification of a new personalized function (room).   In this

specific embodiment, the user of iTV system 100 is typically

10   prompted for a function (room) name (in field 1610), and an

optional password (in fields 1620 and 1630).   Entering a

password in fields 1620 and 1630 has the effect of restricting

or denying access to the personalized function (restrict

access to the location) to any user who does not enter the

15   correct password, including denying access to all the features

associated with the personalized room and the settings

associated with those features.

Upon entering this information, home-style engine 116

stores the function (room) name and optional password

20   information in setting table 200 (in the area of storage for

Personal Room Settings).   In one embodiment, a suitable

mechanism exists for the situation where a password is

forgotten.   For example, there might be an additional input

field on menu 1601, which prompts the user to input a question

25   whose answer provides sufficient information for the user to

determine the forgotten password. Alternatively or in addition, resetting the password might be a service offered by a local cable service provider.

Referring now to FIG.'s 17 and 18, examples 1700 and 1800 illustrate a settings menu for a personalized function (room). "More" options 1740 and 1805 allow the user of interactive TV system 100 to choose setup of more features than those that can fit on one screen. That is, selecting more option 1740 prompts home-style engine 116 to format and display the menu 1801 illustrated in example 1800. And selecting more option 1805 prompts home-style engine 116 to format and display the menu 1701 illustrated in example 1700.

Home-style engine 116 provides a list of preset features for any personalized function that the user of iTV system 100 can select to customize his or her personalized room. In an embodiment, these preset features include, for example, Finance feature 1705, News and Events feature 1710, School feature 1715, Sports feature 1720, Music feature 1725, Web feature 1730, TV feature 1735, Phone feature 1810, Email feature 1815, Calendar feature 1820, and/or Other feature 1825. At the product design level, at least one of the preset features may be omitted, and other features may be substituted in or included in the above-listed features. Each feature typically has a setting in settings table 200, as well as an active/inactive option (1745-1775 and 1845-1865) that reflects

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whether or not that feature is active. As explained with reference to setting up the living room, each of these features can be selectively activated. In this manner, personalized function (rooms) can be customized and features selected to be activated are associated with the person to which the personalized function belongs.

Further as described above with reference to the embodiment of the Customize Living Room Settings menu, all features are initialized to inactive. However still referring to FIG.'s 17 and 18, as shown the user of interactive TV system 100 has already activated eight features (School feature 1715, Sports feature 1720, Music feature 1725, Web feature 1730, TV feature 1735, Phone feature 1810, Email feature 1815, and Calendar feature 1825. Once the user has finished selectively activating the features for his personalized function (room), the X option 410 may be employed to return to the home-style settings menu (FIG. 9).

Referring again to FIG. 9, once one or more personalized functions have been setup, then selecting the personal room settings option 945 would prompt home-style engine 116 to display a personalized settings screen, as shown in example 2800 of FIG. 28. Once rooms, such as Bobby's Room and Krista's Room have been set up the first time (i.e. as in the example sequence shown in FIG.'s 16 - 18), then the next time that a user invokes the personal room settings option 945 on

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menu 901, home-style engine 116 displays a menu that provides

settings options for the the personalized rooms in existence.

Thus in example 2801, it can be seen that Bobby's Room and

Krista's Room have already been set up.

5   To update the settings in an existing personalized room,

such as Bobby's Room, a user selects the Bobby's Room Settings

option 2805. If Bobby's Room is password-protected, then

home-style engine 116 will require verification input in field

2825, before formatting and displaying the Bobby's Room

10   Settings menu (shown in FIG.'s 17 and 18). In this manner,

settings cannot be adjusted for an access-restricted location

without verification input.

Referring again to FIG. 9, the user of interactive TV

system 100 might also choose to activate particular features

15   in the kitchen by selecting the kitchen settings option 965,

which invokes a Customize Kitchen Settings menu (not shown).

The Customize Kitchen Settings menu operates similarly to the

Customized Living Room Settings menu, as described above.

After activating particular features in the Kitchen, the user

20   can return to home-style settings screen menu 901 shown in

example 900. Once the user has finished activating features

in the different functions (rooms), option 410 on menu 901 is

selected to return to the home-style menu 2001.

Referring now to FIG. 20, example 2000 displays on the

25   home-style menu 2001 three functions (Living Room function

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2010, Bobby's Room function 2020, and Kitchen function 2030).

In the sequence of examples that have been presented (FIG.'s 8

through 18 and 23), features have been activated in these

three rooms (2010, 2020, and 2030) only. Because an

5   embodiment of interactive TV system 100 is designed to display

only functions for which associated features are active, menu

2001 displays only these three functions (2010, 2020, and

2030). Thus, menu 2001 reflects the Our Home menu, after it

has been customized by the user to have active features

10   associated with three functions/locations.

Selecting living room function 2010 from the Our Home

menu 2001 prompts home-style engine 116 to typically display

the active living room features 505 and 1310 illustrated in

FIG. 15. Similarly, on menu 2001, selecting Bobby's Room

15   function 2020 or Kitchen function 2030 prompts home-style

engine 116 to typically display the active features in Bobby's

room function (menu 601 in FIG. 6, and menu 1901 in FIG. 19)

and the active features in the Kitchen function (menu 701 in

FIG. 7), respectively.

20   Although FIG.'s 2 through 20 and 23-28 illustrate a

particular embodiment of the invention that is directed to the

surrounding locations of a house, the present invention is

adaptable to organizing functions in a manner that resembles

other types of surrounding locations and environments. To

25   provide a more generalized example of the setup and operation

of an embodiment of the home-style user interface, reference

is now made to FIG. 21. To activate a feature associated with

a particular function (i.e. a location), the user of

interactive TV system 100 typically first invokes a settings

5   menu (block 2110). In one embodiment, the settings menu has a

number of preset functions that can be selected, as well as a

personalized function. The user of iTV system 100 selects a

function for which to activate one or morefeatures (block

2115). If the selected function is a personalized function

10   (Yes to block 2120), then the user of interactive TV system

100 is prompted for a personalized function name and a

password, which is entered optionally to restrict access to

the personalized function (block 2125).

Typically, each of the function settings menus available

15   in an embodiment of interactive TV system 100 have a number of

preset features, as well as an "Other" feature. In an

embodiment, all features for a particular function are

initialized to inactive. The user of iTV system 100 can

select an option associated with each feature to toggle the

20   state of that feature from active to inactive (block 2130).

If the user selects an "Other" feature (Yes to block 2135),

home-style engine 116 prompts the user for more information to

identify information about the event (block 2140) that should

be triggered whenever the activated feature is selected by a

25   user of iTV system 100. The "Other" feature provides the user

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of interactive TV system 100 with the capability of customizing the home-style user interface beyond the preset features provided for each preset function.

Home-style engine 116 typically does not need additional
5   information about the triggerable event (i.e. a feature name or the directory path of an executable application 115) for preset features with the exception of one embodiment where selecting the Other feature prompts the user to enter a command line or file name of a triggerable event, because
10   home-style engine 116 already has that information for preset features as well as customizable features that are already identified to home-style engine 116.

Home-style engine 116 tracks which features are active or inactive, and updates the settings table accordingly (block
15   2145).

Referring now to FIG. 22, flowchart 2200 illustrates an operation of an embodiment of interactive TV system 100. Upon turning on the interactive TV system 100 (block 2205), home-style engine 116 formats and displays a high-level menu that
20   typically includes an option to display a list of functions (i.e. surrounding locations). In order to decide the particular functions to display on the list, home-style engine 116 queries the settings table 200 (block 2215) to determine which functions are active or inactive. If at least one of
25   the features for a particular function is active, then the

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function is considered active and is displayed on the list (block 2220).

From the list of active functions, the user of iTV system 100 can select one of the active functions (block 2225). Home-style engine determines whether the selected function is a personalized function (block 2230). If so (Yes on Block 2230), home-style engine 116 prompts the user of iTV system 100 for a password for the personalized function (block 2235). If the user enters the correct password, then the home-style engine proceeds to block 2240. Access to a password-protected function will typically be denied if the user cannot enter the correct password.

In one embodiment, from the settings table 200, home-style engine 116 determines which features for a particular function are active. Home-style engine 116 formats and displays the active features for the selected function (block 2240). The user of interactive TV system 100 can select from any of the active features (block 2245).

Still referring to FIG. 22, when the user of interactive TV system 100 selects an active feature associated with a particular function (block 2245), home-style engine 116 retrieves information from storage about the triggerable event (i.e. executable application 115). Home-style engine 116 then triggers the appropriate event (block 2250).

Flowcharts 2100 and 2200 can also be used to illustrate a method of setting up an embodiment of the interactive TV system 100 as described in FIG.'s 2 - 20, and 23 - 28, where each of the functions are rooms/locations in a household. To setup up such an embodiment of the customized home-style user interface, a user of interactive TV system 100 selects the Our Home option from the home-style menu (FIG.'s 4, 8, 14, 20, and 24). The Our Home menu displays rooms that have active features, which is why, for example, different rooms appear in each of the referenced examples (400, 800, 1400, 200 and 2400). The embodiment may have software product defaults such that certain predetermined features in one or more of the rooms are initialized to active. In that case, the Our Home menu will initially display those rooms that have one or more features that default to active (as in examples 400 and 2400). In an alternate embodiment, none of the features default to active and in that case, the Our Home menu initially appears without displaying any rooms (as in example 800). As features are activated in the various rooms via the room settings menus, those rooms become active and the Our Home menu displays the active rooms.

To activate a feature in a particular room, the user of interactive TV system 100 first selects the corresponding room settings menu. One method of invoking a particular room settings menu is via Customize Settings option 420 on the Our

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Home menu (block 2110), which invokes the Customize Settings menu 901 (FIG. 9). The Customize Settings menu 901 typically has a number of preset rooms to choose from, as well as a personalized room. The user can select a room in which to activate features (block 2115). If the room selected is a personalized room (Yes to block 2120), then the user of interactive TV system 100 is prompted for a room name (in field 1610) and a password (in field 1620) (FIG. 16), which optionally provides secured access to the room and its features.

Typically, each of the room settings menus available in an embodiment of interactive TV system 100 have a number of preset features, as well as an "Other" feature, as shown in examples 1000, 1100, and 1800 (FIG.'s 10, 11 and 18, respectively). The user can toggle the state of a feature from active to inactive by selecting the associated active/inactive option (block 2130). If the user selects an "Other" feature (Yes to block 2135), home-style engine 116 prompts the user for more information to identify more specifics about the feature and which event to trigger when this "Other" option is activated and accessed subsequently from the corresponding room menu (such as Art Collection 505 on the Living Room menu 1501). This additional information might be available from a list of customizable features with corresponding triggerable events that are already available

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on set top box 120 and defined to home-style engine 116, as in FIG. 23, or this information might include the provision of fields to allow a user to input a feature name and a corresponding triggerable event (i.e. a directory path of an executable application 115) (block 2140), as shown in example 1200 (FIG. 12). Thus, the "Other" option provides the user of interactive TV system 100 with the capability of customizing the home-style user interface beyond the preset features available by default in the different rooms.

Home-style engine 116 typically does not need the additional information (a feature name or the directory path of an executable application 115) for preset features with the exception of certain embodiments of the "Other" feature, because a preset event (i.e. an executable application) is typically already associated with a particular feature.

Home-style engine 116 tracks which features in each room are active or inactive, and updates the settings table 200 accordingly (block 2145).

Reference is again made to FIG. 22 to describe an example of a method of operation of an embodiment of the interactive TV system 100, where the functions are rooms/locations in a household. Upon turning on the interactive TV system 100, home-style engine 116 formats and displays the high-level menu 301 shown in example 300 (FIG. 3). One of the options provided to the user of an embodiment of interactive TV system

100 is to display the Our Home menu (block 2205), as shown in FIG.'s 4, 8, 14, 20 and 24. In order to determine the rooms to display on the Our Home menu, home-style engine 116 queries the settings associated with each room in settings table 200

5 (block 2215) to determine which features in each room are active and which features in each room are inactive. Only active rooms (i.e. those that have active features) are displayed on the Our Home menu. Referring now to FIG. 2, in one embodiment the settings table 200 includes a plurality of

10 settings for each of the preset rooms (e.g., Living Room settings 210, AV room settings 220, Kitchen settings 230, Garage settings 240, Garden settings 250, and/or Gym settings 260), as well as one or more personalized room settings (e.g., personal room 1 settings 270, personal room 2 settings 280

15 through personal room X settings 290).

Home-style engine 116 queries each of the settings in the settings table 200 to determine if any of the features in any of the rooms are active. If at least one of the features is active, then the associated room is considered active and

20 displayed on the Our Home menu. For example, home-style engine 116 queries the living room settings 200 to determine if any of the features in Living Room settings 210 (settings 211 through 218) is active. If at least one feature is active, then the living room is considered active and

25 displayed on the Our Home menu.

Each active room is then displayed on the Our Home menu (block 2220), examples of which can be seen in FIG.'s 4, 8, 14, 20 and 24. From the Our Home menu, the user can select a room (block 2225). Home-style engine 116 determines if the selected room is a personalized room (block 2230). If so (Yes on block 2230), home-style engine 116 determines if the room is secured and if it is, prompts the user for a password for the personalized room (block 2235). If the user enters the correct password, then home-style engine 116 proceeds to block 2240. Access to a password-protected personalized room will typically be denied if the user cannot enter the correct password.

From the settings table 200, home-style engine 116 determines which features within a particular room are active. Home-style engine 116 formats and displays the active room features on the room menu (block 2240). Examples 500, 600, 700, 1500, 1900, 2500, 2600, and 2700 (FIG.'s 5, 6, 7, 15, 19, 25, 26 and 27, respectively) are illustrative of particular room menus. The user of interactive TV system 100 can select any of the room features (block 2245). Alternatively, the user of an embodiment of interactive TV system 100 can access the settings menu for a particular room via the settings button.

For example, Living Room Settings 915 appears in example 1500 (FIG. 15), along with the other active living room

features (finance feature 505, and art collection feature 1310). Selecting Living Room Settings 915 will take the user of interactive TV system 100 to, for example, the Customize Living Room Settings menu 1301 (FIG. 13).

5 Still referring to FIG. 22, when the user of interactive TV system 100 selects a feature other than the settings option (block 2245), home-style engine 116 queries the setting table 200 for information associated with the selected features and determines the event to trigger. Home-style engine 116 then 10 triggers the appropriate event (block 2250).

Other variations and modifications of the above-described embodiments and methods are possible in light of the foregoing teaching. For example, the interactive television might be located in a resort and the function (surrounding locations) 15 might include the different amenities at the resort. A personalized function might be a resort guest's room, and might include features such as email or voice mail, or information about the resort guest's bill.

As another example, instead of using a password to 20 restrict access to a personalized function, password protection might be implemented at the feature level. Further, other methods of security may be used for securing both functions and features, such as, for example, fingerprint identification, voice identification, and/or other types of 25 security access codes or verification or security methods.

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Further, at least some of the components of this invention may be implemented by using a programmed general-purpose digital computer, by using application specific integrated circuits or field programmable gate arrays, or by

5   using a network of interconnected components and circuits. Connections may be wired, wireless, by modem, and the like.

It is also within the scope of the present invention to implement a program or code that can be stored in an electronically-readable medium to permit a computer to perform

10   any of the methods described above.

The above description of illustrated embodiments of the invention, including what is described in the Abstract, is not intended to be exhaustive or to limit the invention to the precise forms disclosed. While specific embodiments of, and

15   examples for, the invention are described herein for illustrative purposes, various equivalent modifications are possible within the scope of the invention, as those skilled in the relevant art will recognize.

These modifications can be made to the invention in light

20   of the above detailed description. The terms used in the following claims should not be construed to limit the invention to the specific embodiments disclosed in the specification and the claims. Rather, the scope of the invention is to be determined entirely by the following

claims, which are to be construed in accordance with established doctrines of claim interpretation.